

NEUTRON CAPTURE CROSS SECTIONS FOR THE RE/OS CLOCK

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The radioactive decay of $^{187}\text{Re} \rightarrow ^{187}\text{Os}$ ($t_{1/2} = 43$ Gyr) is suited for dating the onset of heavy element nucleosynthesis. The radio-genic contribution to the ^{187}Os abundance is the difference between the natural abundance and the corresponding s-process component. This component can be obtained via the well established $\langle \sigma \rangle_N$ systematics using the neighboring s-only isotope ^{186}Os , provided the neutron capture cross sections of both isotopes are known with sufficient accuracy.

We report on a new set of experiments performed with a C6D6 detector array at the n_TOF neutron spallation facility of CERN. The capture cross sections of ^{186}Os , ^{187}Os , and ^{188}Os have been measured in the neutron energy range between 1 eV and 1 MeV, and Maxwellian averaged cross sections were deduced for the relevant thermal energies from $kT = 5$ keV to 100 keV.